

- . *Notes on Australian athecate hydroids*. Rec. Austral. Mus. Sydney. **18**: 279-282. 1931.
- COCKS, W. P. *Contributions to the fauna of Falmouth*. Ann. Rep. Roy. Cornwall Polytech. Soc. **17**: 38-102. 1849.
- . *Contributions to the fauna of Falmouth, 1853*. Ann. Rep. Roy. Cornwall Polytech. Soc. **21**: 28-36. 1853.
- CORDERO, E. H. *Observaciones sobre algunas especies sudamericanas de género Hydra*. II. *Hydra y Cordylophora en el Uruguay*. Ann. Acad. Brasil. Sci. **13**: 173-184 figs. 1-26. 1941.
- FABRICIUS, O. *Fauna Groenlandica*. 1780.
- FINLAY, H. J. *Notes on New Zealand and Australian gymnoblastic hydroids*. Austral. Zool. **5**: 257-261. 1928.
- FRASER, C. M. *Hydroids of the Atlantic coast of North America*. Toronto, 1944.
- . *Distribution and relationship in American hydroids*. Toronto, 1946.
- FYFE, M. *A new fresh water hydroid from Otago (New Zealand)*. Trans. Proc. New Zealand Inst. **59** (4): 813-823. 1929.
- GMELIN, J. F. In Linnaeus, *Systema naturae*, ed. **13**, **1**(6): 3131. 1791.
- JÄDERHOLM, E. *Mitteilungen über einige von der Schwedischen Antarctic-Expedition 1901-1903 eingesammelte Hydroiden*. Arch. Zool. Exp. et Gen. Notes et Revue, ser. 4, **3** (1): i-xiv. 1904.
- LEIDY, J. [The Proceedings, Oct. 18, 1870.] Proc. Acad. Nat. Sci. Philadelphia **22**: 113. 1870.
- MARTYN, T. *Universal conchologist* **1**: fig. 12. 1784.
- PALLAS, P. S. *Reise durch verschiedene Provinzen des Russischen Reichs* **1**(5): 1-504, 24 pls. St. Petersburg, 1771.
- ROCH, F. *Experimentelle Untersuchungen an Cordylophora caspia (Pallas) etc.* Zeitschr. Morph. und Ökol. Tiere. **2**: 350-426; 667-670. 1924.
- SARS, M. *Beretning om en i Sommeren 1849 foretagen Zoologisk reise i Lofoten og Finnmarken*. Nyt. Mag. Naturvid. Christiana **6**: 121-211. 1850.
- SCHULZE, P. *Die Hydroiden der Umgebung Berlins mit besonderer Berücksichtigung der Binnenlandformen von Cordylophora*. Biol. Zentralbl. **41**: 211-237. 1921.
- WARD, H. B., and WHIPPLE, G. C. *Fresh water biology*. New York, 1945.

ZOOLOGY.—*The diplopod family Campodesmidae (Polydesmida)*. RICHARD L. HOFFMAN, Clifton Forge, Va. (Communicated by E. A. Chapin.)

The name Campodesmidae was proposed in 1895 by O. F. Cook. Appearing in a key to the tropical African families of polydesmoid millipeds, the original description was rather inadequate. Subsequently, in several publications cited below, additional information (of a fragmentary nature) was given about the family and its two genera, but later workers have never been able to derive a very satisfactory idea of the nature of the group. It is a matter of some interest that campodesmids have never been encountered by other workers, who have managed to come across most of the other West African genera described by Cook.

Since the great majority of Cook's Liberian species have never been adequately described and have been mostly ignored by later workers, it appears necessary to re-describe them. Through the unflinching cooperation of Dr. E. A. Chapin, I have been able to study the Cook collection now in the U. S. National Museum. The present paper, the first of a planned series, is concerned with the campodesmids and with the systematic position of the family.

#### Family CAMPODESMIDAE Cook

Campodesmidae Cook, Proc. U. S. Nat. Mus. **18**: 82. 1895; Amer. Nat. **30**: 414. 1896.

*Diagnosis*.—Male gonopods large, prominent, protruding from a large oval sternal aperture. Coxae subcylindrical, attached loosely to each other, largely concealed within the aperture. Prefemur small, with a large unbranched laminate prefemoral process. No distinction between femur and tibiotarsus, the latter distally elongate, slender, forming nearly a complete circle.

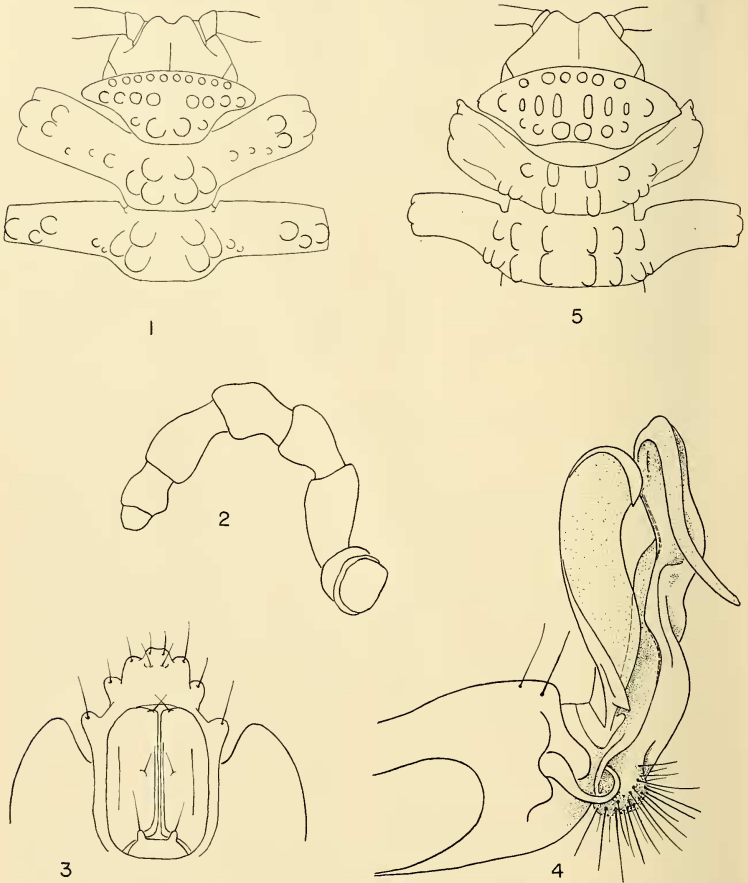
Gnathochilarium and mandibles typical of the usual polydesmoid form.

Antennae of moderate heaviness, with a few scattered hairs. Four sensory cones, concealed within the seventh article.

Head finely granular, with a well-defined vertical groove. A prominent ovoid longitudinal swelling immediately under each antennal socket. Clypeal area much swollen, raised above level of frons, glabrous.

Collum rather small, not concealing the head and much exceeded in width by the keels of the second segment.

Keels of midbody segments well developed, wide as body cavity but narrow and widely



FIGS. 1-5.—1, *Campodesmus carbonarius*, dorsal view of head and first three segments; 2, same, antenna, much enlarged; 3, ventral view of last two segments; 4, left male gonopod, mesial aspect; 5, *Tropidesmus jugosus*, dorsal view of head and first three segments. Figures drawn to different scales.

separated from each other. Keels strongly depressed causing tergites to be highly arched.

Repugnatorial pores small, not on special stalks, occurring only on segments 5 and 7.

Anal segment large, not concealed by nineteenth, with three large tubercles on each side, distally bent slightly downward.

Preanal scale small, trapezoid, with two elongate setiferous tubercles. Anal valves nearly plane, each with a median tubercle.

Sternites rather broad and smooth, without special modifications.

Legs of moderate length and size, without spines, lobes, or tarsal pads.

Pleurites without carinae or large tubercles.

*Range*.—Known only from Liberia.

*Genera included*.—Two, which may be separated as follows:

1. Tergites each with a cluster of three elongate upright tubercles on each side of middle.

*Campodesmus*

Tergites each bearing two transverse rows, each of six short longitudinal carinae.

*Tropidesmus*

Genus *Campodesmus* Cook

*Campodesmus* Cook, Proc. U. S. Nat. Mus. 18: 82. 1895.

*Generotype*.—*C. carbonarius* Cook, by monotypy.

*Diagnosis*.—With the characters of the family, particularly distinguished by the ornamentation of the tergites. Collum with a row of 10 small tubercles on the anterior margin; a second row of eight larger tubercles across the middle. On the caudal half are two still larger tubercles with a small one laterad to each. Tergites of midbody segments with a cluster of three tubercles on each side of middle, these largest at midbody and diminishing towards the ends. Each keel bears three rounded tubercles near the outer end and two small ones at the base.

*Campodesmus carbonarius* Cook

*Type specimen*.—U. S. Nat. Mus., adult male, collected at Mount Coffee, western Liberia, by O. F. Cook.

*Diagnosis*.—With the characters of the genus. Dorsal color dark brown, underparts whitish. Length, from 28 to 38 mm.

Male gonopods of the form represented in Fig. 4.

Genus *Tropidesmus* Cook

*Tropidesmus* Cook, Amer. Nat. 30: 414. 1896.

*Generotype*.—*T. jugosus* Cook, by monotypy.

*Diagnosis*.—Differing from *Campodesmus* chiefly in the nature of the ornamentation and in size and shape of the collum, as illustrated. Also, the second segment is not as wide and is somewhat more bent anteriorly. Collum with six tubercles along the front margin; eight in the second row (of which those at the ends are rounded, the others elongate); and six tubercles in the third row, of which the middle two are much enlarged. Second segment with keels produced forward, partially embracing and subtending the collum; dorsally with four short middorsal carinae and smaller indistinct tubercles laterad. On following segments the dorsal carinae increase to 12, in two transverse rows of six each. A single large swelling at the end of each keel.

*Tropidesmus jugosus* Cook

*Type specimen*.—U. S. Nat. Mus. (adult male?)<sup>1</sup> collected at Mount Coffee, Liberia, by O. F. Cook.

*Diagnosis*.—With the characters of the genus. Size and color about the same as in *Campodesmus*. The male gonopods may be expected to present additional specific and generic characters.

SYSTEMATIC POSITION OF  
THE CAMPODESMIDAE

The campodesmids seem not to be closely related to any other of the African polydesmoid millipeds. The family clearly falls into the group for which Brolemann in 1916 proposed the name "Leptodesmina." This ensemble is characterized by the fact that the coxae of the male gonopods are only slightly attached together, are not attached to the sternal aperture, and are generally concealed within the body when at rest.

In Attems' most recent key to the polydesmoid families (1937), *Campodesmus* runs down to the family Leptodesmidae (properly Chelodesmidae, *vide* Hoffman, 1950). The

<sup>1</sup>The original description mentions an adult male. The vial of material sent to me was labeled "Type" but contained only immature specimens. Presumably the mature specimen was taken out and is for the present misplaced in the body of the Museum collection.

configuration of the gonopod certainly vindicates this allocation, as the large pre-femoral process occurs in nearly all of the South American chelodesmid genera. In other characters, however, no particular relationship can be observed. Rather some similarity is seen with the Platyrhacidae, a family occurring in the East Indies and in Middle America but unrepresented in the Ethiopian region. The chief platyrhacid features obtain in the broadened anal segment, subantennal swellings, and general appearance of the sternites.

The shape of the preanal scale and the dorsal sculpture are very reminiscent of certain genera (notably *Orodesmus*) of the Oxydesmidae, a small family occurring in Central and West Africa.

Considering the various developments of campodesmids which are duplicated in other families in different parts of the world, and the absence of any specialization such as pronounced sexual dimorphism, modifica-

tion of the legs of males, etc., I am for the present inclined to regard the Campodesmidae as representative of a generalized ancestral chelodesmoid stock, a supposition not unsupported by the present areal distribution of the families concerned.

#### LITERATURE CITED

- ATTEMS, CARL GRAF. *Fam. Strongylosomidae*. In *Das Tierreich*, Lief. **68**: 1-300. 1937.
- BROLEMANN, HENRI W. *Essai d'une classification des Polydesmiens*. *Ann. Soc. Ent. France* **84**: 523-608. 1916.
- COOK, ORATOR F. *East African Diplopoda of the suborder Polydesmoidea, collected by Mr. William Astor Chanler*. *Proc. U. S. Nat. Mus.* **18**: 81-111. 1895.
- . *A new diplopod fauna in Liberia*. *Amer. Nat.* **30**: 413-420. 1896.
- . *Summary of new Liberian Polydesmoidea*. *Proc. Acad. Nat. Sci. Philadelphia for 1896*: 257-267.
- HOFFMAN, RICHARD L. *The status of the milliped Chelodesmus marxi Cook, and of the family name Chelodesmidae*. *Proc. Biol. Soc. Washington* **63**: 185-188. 1950.